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ABSTRACT

Five of 14 junior colleges in Pennsylvania that have implemented programs of packaged financial assistance to students were studied to examine the effects of the aid in promoting academic persistence and achievement. Four groups of students were studied: aid recipients and non-recipients who earned less than $100.00 from part-time work during the 1967-68 academic year, and aid recipients and non-recipients who earned $100.00 or more in the same period. The study attempts to determine: (1) the personal, academic, and socio-economic characteristics of aid recipients compared with non-recipients; (2) the employment patterns of community college students; (3) whether financial aids make a difference in student achievement and persistence; and (4) if scholarships, grants, loans, and/or employment are given to the most needy or the most capable students, or to those with a combination of need and ability. Community college educators view financial aids as necessary. In the opinion of recipients, aids have a definite value in enabling them to attend college. This study showed that aid recipients, despite a socio-economic handicap, are as successful academically as non-recipients with more money and cultural advantages. (CA)

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FINANCIAL AIDS FOR COMMUNITY COLLEGE STUDENTS

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Research Report No. 10

Harrisburg Area Community College
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Harrisburg, Pennsylvania 17110

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RESEARCH REPORTS AT H.A.C.C.

#1. A Profile of Students. 1969, $2.00. ERIC document ED-037-203.

#2. A Profile of Graduates. 1969, $2.00. ERIC document ED-037-204.

#3. A Profile of Non-Persisting Students. 1970, $2.00. ERIC document ED-037-218.

#4. 1966 Transfer Student Performance. 1970, $1.50. ERIC document ED-040-698.

#5. Persistence of Developmental Students. 1970, $2.00. ERIC document ED-042-438.

#6. The Adult Student Population. 1971, $2.00.

#7. The Employment of Career Graduates. In process.

#8. Community Attitudes Toward the Community College. 1971, $2.00.

#9. Faculty Readiness for Innovation: A Case Study. In process.

#10. Financial Aids for Community College Students. 1971, $2.00.

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Statistical analyses were completed at the Computation Center of the Pennsylvania State University, using the input facilities at the Capitol Campus.

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Education beyond high school is increasingly viewed as necessary for occupational preparation, for a general education in a complex world, and for self-fulfillment. For youth from low socio-economic backgrounds, some education at the post-secondary level is often a prerequisite to occupational and social mobility. Therefore, educators must be concerned with equal opportunity for youth from all backgrounds to acquire a college education.

The community college is viewed as an "opportunity" college for growing numbers of students having diverse abilities and interests (AAJC, 1967, p. 10). Across the country, over 1.6 million students were enrolled in 781 public two-year colleges during 1970 (Carnegie Commission on Higher Education, 1970). In Pennsylvania alone 38,000 students (24,700 full time) were enrolled in community colleges during 1969, and this number is expected to reach 96,000 by 1978 (Pennsylvania Department of Education, 1969, p. 9).

Community colleges enroll students from a variety of socio-economic backgrounds, and these colleges attempt to provide educational programs and services to encourage such enrollments. They offer a broad spectrum of programs for occupational preparation in middle-manpower jobs and for the first two years of a baccalaureate education. Still, enrollments at community colleges are largely middle and lower-middle class. Youth from the most needy segments of society do not attend in large numbers (Ferrin, 1970; Knoell, 1970). Community college educators need to develop strategies which are more effective in promoting the attendance, achievement, and persistence of needy students.

Need for the Study

While there may be growing support for the concept of equal access to post-secondary education, there are limited provisions for the financial support of low-income youth who are presumed to have the choice of attending college. There are several reasons for this limitation, growing from the nation's traditional practices and past beliefs, and from a lack of information about financial aids. These reasons include the following:

1. The belief that anyone who wants to, can attend college, regardless of his financial resources.

2. The belief that not everyone should attend college anyway, for a variety of reasons.

3. Past practice of rewarding outstanding high school students with "scholarships," regardless of their financial need.

4. The practice of supporting existing private colleges by offering financial aids from both public and private sources to students who wish to attend these private institutions rather than less expensive public colleges.

5. The practice of awarding financial aids to students from middle-income families, to moderate the burden of college costs. This practice has been reinforced by those practices listed in (3) and (4).

6. The lack of solid tradition of allocating substantial public funds for financial aids to college students, except for brief periods of time related to crisis points in our history.

7. The lack of evidence that financial aids to students really result in increased attendance, persistence, and achievement at college.

Financial aids in the form of scholarships or grants, loans, and employment opportunities have been extended over past years to college students, frequently in the expectation that their attendance or academic success would be enhanced. Many studies have investigated the educational outcomes of recipients of these aids. But most studies have focused on special student groups such as gifted National Merit winners or recipients of aid from a single source, and they almost always dealt with students at four-year colleges and universities where students from lower socio-economic strata were largely unrepresented. There is a dearth of research concerned with students at open-admission colleges and of controlled research which may show effects of financial aids.

Past research has not described recipients of financial aids at public community colleges, nor are there adequate profiles of the "packages" of aid which these students receive. Relationships between student characteristics and types and extents of aids they receive have not been explored. Although, presumably, most community colleges have comprehensive policies which guide the awarding of aid, empirical reviews of local aid programs and practices do not appear in the literature. This study contributes toward meeting this need, both in terms of methodology and information about the distribution of student aids.

An essential value of the study lies, however, in its examination of the effects of financial aids in promoting academic persistence and achievement by community college students. Past studies have inferred such effects, but these studies were limited by inadequate control of other key variables of ability and socio-economic status known to be related to academic outcomes. Also, these studies dealt typically with populations different from those found at public community colleges. Those who develop and administer institutional and public policy (college

and government administrators, financial aid officers, faculty committees, boards, and legislators) have both the right and the obligation to assess the results of expenditures of financial aid funds, and this study of the effectiveness of financial aids contributes directly to such assessments.

Related Research

An earlier study (Snyder, 1971) contained an extensive review of research related to college aspirations and attendance, persistence and achievement at college, patterns of financial aid awards, effects of financial aids, and effects of employment. This earlier research can be summarized as follows:

1. A large number of personal characteristics and environmental factors are related to aspirations for and attendance at college. These include ability, social status (including parents' education and father's occupation), neighborhood, type of residence, peer relationships, motivations, and sex. Effects have been traced to complex interactions of these factors. Particularly, men and women are affected differently.

2. Students at public junior colleges are different from those at four-year colleges and universities in that junior college students tend to have lower abilities and lower socio-economic backgrounds and may be enrolled in career preparation programs which are often more immediately useful than those at four-year colleges. Junior college students tend to aspire to less extensive and more immediate educational goals.

3. Some factors which are related to college aspirations and attendance are also related to attrition from college. These include ability, father's occupational level, and attitudes toward education. Yet, reasons for attrition are often non-academic, and they differ somewhat for men and women.

4. Most of the research on college aspirations, attendance, persistence, and achievement has focused on students at four-year colleges, and it is doubtful whether conclusions from these studies can be generalized to other student groups of diverse backgrounds and characteristics.

5. While there is no clear agreement on the extent of college attrition due to financial need, two broad reviews concluded that financial problems are important, ranking just behind motivational and study problems.

6. Relatively little research on student aids has been completed at specific colleges, and it is suggested that financial aid officers are not active in conducting research and are not aware of what research has been done.

7. Overall, governmental funding of financial assistance to students has been more influenced by national crises and tradition than by research findings or broad social consensus.

8. Most of the financial aid funds awarded by colleges have been to students who are not the most needy, but who come from average and above socio-economic backgrounds. In Pennsylvania, scholarships awarded by the Pennsylvania Higher Education Assistance Agency have apparently been distributed with minor regard for family income among students whose families earned $15,000 and below. However, Federal funds appear to have been awarded more clearly to the most needy students.

9. Little research has been directed toward identifying financial aid recipients who attend community colleges.

10. A number of studies have inferred or concluded that offers of financial aids did or would encourage low-income students to attend college and improve persistence at college, and this is true for students at both two-year colleges and four-year colleges.

11. A number of studies have inferred that community college students have a high need for financial assistance, despite "low" college costs, because of low levels of family support.

12. Several studies of aid recipients at four-year colleges found that financial aids are related to whether or not an individual continues at college, but the controls for other variables were often missing. No studies of either four-year or two-year college students were identified which have considered the effects of financial aids while controlling for student differences in ability or prior achievement, socio-economic measures, and sex.

13. Studies have shown that college students at both two-year and four-year institutions frequently hold part-time jobs, and two-year college students are more dependent upon their own resources than are students at four-year colleges. However, there has been some question about whether two-year college students work to meet college expenses or for other personal reasons.

14. A large number of studies show no clear relationship between the extent of students' part-time employment and their academic achievement.

Research Questions and Hypotheses

The study was directed toward several research questions, as noted:

1. What are the personal, academic, and socio-economic characteristics of aid recipients, and how do these compare to characteristics of non-recipients?

2. Are scholarships and grants, loans, and employment given to students who are most needy, most capable, or to those with some combination of need and ability? What combination of these and other factors applies?

3. What are the employment patterns of community college students?

   a. To what extent are students employed while attending classes during the academic year?
   b. Is employment limited to low-income students, or do students take employment regardless of family income levels?
   c. Does employment relate to continued full-time study? If so, is this true regardless of family income level?

4. Do financial aids make a difference in student achievement and persistence? Are certain types of aids more "potent" than others?

Because of the nature of these questions and resultant hypotheses, the aid recipients and the non-recipients were each subdivided into employed and non-employed students, as noted:

Group A. Aid recipients who reported part-time employment during the academic year to result in earnings of less than $100.

Group B. Aid recipients who reported part-time employment during the academic year to result in earnings of $100 or more.

Group C. Non-aid recipients who reported part-time employment during the academic year to result in earnings of less than $100.

Group D. Non-aid recipients who reported part-time employment during the academic year to result in earnings of $100 or more.

The hypotheses for this study were expressed in null form:

1. There are no differences between groups A, B, C, and D in terms of certain personal, academic, and socio-economic characteristics of the subjects.

2. There are no relationships among the several types of aid and employment and the several predictor variables of personal, academic, and socio-economic characteristics.

3. There are no differences between groups A, B, C, and D in terms of their levels of academic achievement and persistence at the community college as measured separately by several criteria of academic retention and achievement.

Study Procedure

The Population and Subjects

The first community college in Pennsylvania opened in 1964, and by 1970, 12 community college districts in the state operated 14 campuses. By the 1967-68 academic year, several of these colleges had implemented programs of packaged financial assistance to students and were able for this study to identify aid recipients and the amounts and types of aid granted to each student. These colleges include Community College of Allegheny County (Allegheny Campus), Bucks County Community College, Harrisburg Area Community College, Montgomery County Community College, and Community College of Philadelphia. Each college offers a comprehensive set of educational programs for employment preparation, for transfer to senior colleges, and for remedial education or learning skill development. Each is non-selective in admissions, although specific criteria for course placement exist once a student is admitted.

The colleges differ in the demographic characteristics of the areas they serve and in their student bodies. The Allegheny Campus of the Community College of Allegheny County (Pittsburgh) and the Community College of Philadelphia serve large urban areas, and they include a larger proportion of Black students than do the others. Montgomery County Community College serves an industrial-residential suburban area adjacent to Philadelphia. Bucks County Community College serves a mixed suburban, small town, and rural area just north of Philadelphia. Harrisburg Area Community College serves a three-county area in the south-central part of the state, which includes the state capital (a city of about 70,000), contiguous suburban areas, and large areas containing small towns and open country.

Community colleges may be described through their enrollments and the types of their curricula. Table I shows the full-time enrollments and percent enrolled in occupational and transfer curricula at each college for fall 1968, the first year for which such data were available (Sheppard, 1969). Enrollments at the two urban colleges were primarily in occupational programs, whereas the enrollments at the remaining three colleges were primarily in transfer programs.

TABLE I
FULL-TIME ENROLLMENTS IN OCCUPATIONAL AND TRANSFER CURRICULA AT PARTICIPATING COLLEGES

	Occupational		Transfer		Total	
	N	%	N	%	N	%
Allegheny	1540	61.0	986	39.0	2526	100.0
Bucks	390	24.9	1178	75.1	1568	100.0
Harrisburg	508	31.9	1086	68.1	1594	100.0
Montgomery	464	32.9	948	67.1	1412	100.0
Philadelphia	1266	52.4	1148	47.6	2414	100.0
Total	4168	43.8	5346	56.2	9514	100.0

The subjects for this study included students who had matriculated at the participating colleges for the first time during the summer or fall 1967 and who were enrolled as full-time students during the fall 1967. The financial aid recipient group included those students who had received $100 or more in financial assistance as known to the respective financial aid offices or as identified from the student questionnaire, either grants or loans, from any source, during the 1967-68 year.

A comparable control group was chosen from the participating colleges. This group of non-recipients was chosen randomly from among those students who were qualified as subjects, but who received less than $100 in financial assistance in either grants or loans during the 1967-68 year. The control group was chosen originally to include one-fourth more subjects from each college than the respective aid recipient groups.

The numbers of former students who were originally identified by respective colleges are shown in Table 2. In all, 305 aid recipients and 377 non-recipients were included in sample groups. Although Montgomery County Community College had agreed to participate in the study, the number of aid recipients (16) and corresponding sample of non-recipients was insufficient to judge the extent of their representation to the entire student body. Therefore, the data for students from this college were removed from the study.

TABLE 2
NUMBER OF AID RECIPIENTS AND NON-RECIPIENTS
ORIGINALLY CHOSEN FROM EACH COLLEGE

	Number in Samples	
	Aid recipients	Non-recipients
Allegheny	58	70
Bucks	57	71
Harrisburg	98	125
Montgomery	16	16
Philadelphia	76	95
Total	305	377

The Data and its Collection

Data for several types of variables were collected, relating to personal and academic background of the student, financial aids and employment earnings, and academic achievement and persistence. Additional explanation or description of these variables can be found in the general

instructions to colleges (Appendix A) and the questionnaire to former students (Appendix B). They are noted as follows:

1. Age as of December 31, 1967, as continuous data.

2. Sex.

3. ACT Composite score. The Composite standard score from the American College Testing Program examination, as continuous data.

4. High school class rank. Class rank was transformed to standard scores,using a conversion table recommended by the American College Testing Program (Munday, Lenning, and Wimpey, 1969, p. 43). Appendix C contains the table for converting high school quintile to standard score.

5. Family income, as continuous data.

   a. For dependent students, 1966 family income.
   b. For independent or married students, 1967 estimated income for self or combined family.

6. Number of years' formal schooling completed by student's father. Continuous data, from 0 through 20.

7. Occupational level of father. Occupational levels were similar to those used in the Dictionary of Occupational Titles (U.S. Department of Labor, 1965). Also, see Hatt and North (1962, pp. 277-283). Data are ordinal.

8. Scholarships or grants. Included dollar value of scholarships, grants, or awards from public or private sources for 1967-68. Any awards not requiring repayment or services were included.

9. Loans. Included dollar value of loans from any public or private sources, groups, or individuals for 1967-68. Loans which may become forgivable, dependent upon the future activity of the recipient, were included.

10. Employment. Included dollar value of earnings from any kind of employment, at any location, whether or not the employment was subsidized with public or Federal funds, for 1967-68.

    Grants or scholarships, loans, and earnings were noted separately for each of two academic years and the interim summer months.

11. Continuous attendance at the college, either full or part-time, through four semesters during the academic years of 1967-68 and 1968-69, not counting summers. Yes or No.

12. Receipt of an associate degree or certificate (a program of one year's duration or more) by June 30, 1970. Yes or No.

13. Total credit hours earned at the college through June, 1970.

14. Cumulative grade-point average earned at the college through June, 1970.

Sources of data. Data were collected from two sources: (1) a form completed by the financial aid office from college records (Appendix D); and (2) a questionnaire completed by the former student (Appendix B). Colleges provided information about all items of personal background except the years of education completed by students' fathers, occupational level of students' fathers, and family income for non-recipients of aid; about all forms of financial aid and employment which were administered by or known to the college; and about all measures of academic success and persistence.

Students provided information about family income, fathers' schooling and occupational level, scholarships or grants, loans, employment earnings and hours, certain attitudes toward financial aids, and whether they transferred to another college before earning the associate degree. Thus, for aid recipients, information was received from colleges and from students about family income, scholarships or grants, and loans. For all students, information about employment earnings and hours was received from both sources.

Collection of the data. Names and addresses for subjects were supplied by respective financial aid officers. Subjects included all known aid recipients, and for non-recipient samples every Nth person on appropriate matriculation lists. A questionnaire was mailed to each subject, along with a pre-addressed and stamped return envelope and an introductory letter signed by the president of the college which the student had attended. Three follow-up letters were sent to non-respondents for whom the questionnaire was not known to be non-deliverable.

An initial procedure was conducted to examine the data received on college forms and respondent questionnaires and to rectify inconsistencies, omissions, and suspected errors. The financial aid officers at the participating colleges assisted in reviewing student data which appeared suspect.

Differences in amounts of financial aids and employment earnings reported by the two sources occurred frequently. The writers prepared an additional data form which contained adjusted data for financial aid amounts and employment earnings. Data from this form were used in the analyses of financial aid amounts and employment earnings. For grants and loans, data from the college sources were recorded, except after consultation with financial aid officers. For employment earnings, data from former students were recorded, except for employment at the college and college work-study. Also, employment earnings were adjusted in line with reported hours of employment, using a broad hourly earnings guideline.

Data for family income were taken from either the college source (preferred) or from the student questionnaire. Also, either parents' income for dependent students or personal family income for independent students was recorded. Other studies have shown that student-reported income is generally accurate. Therefore, the composite source of family income appeared acceptable for this study.

The numbers of subjects and respondents from each college, after a number of removals and replacements of non-qualified subjects and adjustments in aid recipient status of respondents, are shown in Table 3. Usable questionnaires were received from 57.3 percent of the subjects, overall. Questionnaires were undeliverable to 60 subjects, or 11.2 percent.

TABLE 3
FINAL SAMPLE AND RESPONDENT SIZES BY COLLEGE AND AID RECIPIENT STATUS, AFTER CHANGES IN RESPONDENTS' RECIPIENT STATUS

	Aid Recipients			Non-Recipients		
	Subjects	Respondents		Subjects	Respondents	
	N	N	%	N	N	%
Allegheny	43	22	51.2	41	18	43.9
Bucks	40	33	82.5	83	45	54.2
Harrisburg	108	66	61.1	108	67	62.0
Philadelphia	68	35	51.5	43	20	46.5
Total	259	156	60.2	275	150	54.5

Treatment of the Data

Tests for differences between respondents and non-respondents were conducted for a number of personal and academic achievement variables, using t tests for independent samples or chi-square. Other tests are noted in the following paragraphs.

Hypothesis 1. For each of the variables listed in Table 4, a test of differences between groups A, B, C, and D was conducted. For most variables, a two-way (sex x group) analysis of variance was conducted. Differences in father's occupational level were examined using the Kruskal-Wallis one-way analysis of variance, separate for men and women. Differences in combined amounts of scholarships, loans, and employment were examined using a t test for independent samples.

Hypothesis 2. An intercorrelation matrix was completed for all variables shown in the left column of Table 4, except for father's occupational level, separately for men and women in each group A, B, and D. Step-wise multiple correlation procedures were completed to

TABLE 4
SCHEDULE FOR TESTING HYPOTHESIS I, SHOWING ALL VARIABLES, TYPES OF AVERAGES, GROUPS, AND TYPE OF TEST USED

Variable	Average	Group A M	A F	B M	B F	C M	C F	D M	D F	Test
Age	mean	x	x	x	x	x	x	x	x	2-way anova
ACT score	mean	x	x	x	x	x	x	x	x	"
High school rank	mean	x	x	x	x	x	x	x	x	"
Father's educational level	mean	x	x	x	x	x	x	x	x	"
Family income	mean	x	x	x	x	x	x	x	x	"
Father's occupational level	median	x	x	x	x	x	x	x	x	Kruskal-Wallis
Scholarship amounts	mean	x	x	x	x					2-way anova
Loan amounts	mean	x	x	x	x					"
Combined scholarship & loan amounts	mean	x	x	x	x					"
Employment amounts	mean			x	x	x	x			"
Combined scholarship, loan, & employment amounts	mean			x	x					t test

determine the extent that several factors accounted for financial aid amounts and for employment earnings.

Hypothesis 3. Differences were examined separately for men and women between groups A, B, C, and D, for the following criteria of college persistence and attendance outcomes: (1) total credit hours earned, (2) cumulative grade-point average, (3) continuous attendance for two years, (4) earning an associate degree or one-year certificate, and (5) earning an associate degree or certificate or transferring directly to a four-year college without earning a degree. Analyses of covariance, using high school rank and family income as covariates, were completed across the groups for the criteria of credit hours and grade-point average, separately for men and women.

To test for differences between recipient groups for the remaining three criteria, a series of chi-square calculations was made across groups A, B, C, and D, separately for men and women. Each sex was grouped into two levels of high school rank and, independently, into two levels of family income. Table 5 illustrates the frequency distributions which were tested.

TABLE 5
DATA ARRANGEMENT FOR CHI-SQUARE TESTS
OF HYPOTHESIS NUMBER THREE

		Non-Emp Recip A	Empl'd Recip B	Non-Emp Non-Rec C	Empl'd Non-Rec D
High School Rank	High				
	Low				
Family Income	High				
	Low				

Other evaluations. Other evaluations of responses conducted included the following: extent of employment; reasons for employment; and necessity for, advantages of, and obligations resulting from receiving financial aids. Statistical procedures included analysis of variance, chi-square, and simple data tabulations.

The Findings

Data for this study were taken only from subjects who completed a questionnaire. As a result, in order to judge how well the findings applied to the original study population, it was necessary to compare respondents' characteristics with those of non-respondents. This section of the report contains this comparison, the findings which relate to the three hypotheses, and several other evaluations. All tables referred to in this section are included in the Appendix.

The respondent sample differed considerably from the non-respondents (Tables 6 and 7). Compared to non-respondents, they had higher academic achievement in high school and higher ACT scores, were more successful and persistent at the community college, and included proportionally more women. They did not differ in age, marital status, type of curriculum or prior transfer-student status. As a result of these differences, the remaining findings must be viewed with caution and with appropriate consideration of the bias which is included in the respondent sample.

Description of Study Groups

The first hypothesis was stated: There are no differences between groups A, B, C, and D in terms of certain personal, academic, and socio-economic characteristics of the subjects. This hypothesis was tested by two-way analysis of variance or by one-way Kruskal-Wallis analysis of variance.* The treatments in the two-way analyses were sex and aid recipient-employment designation, to include (A) aid recipients, non-employed; (B) aid recipients, employed; (C) non-recipients, non-employed; and (D) non-recipients, employed.

Two-way analyses of variance were conducted for the following variables: age; ACT Composite score; high school rank; father's educational level; family income; scholarship amount; loan amount; combined scholarship and loan amount; employment earnings; and combined scholarship, loan, and employment amount. A Kruskal-Wallis analysis of variance was conducted for father's occupational level. Significance for all analyses was determined at the .05 level.

Mean ages for subjects ranged from a low of 19.0 to a high of 21.2 (Table 8). Mean ACT scores ranged from 17.5 to 19.3 (Table 9). No significant differences were found in age or ACT scores between men and women, between aid-employment groups, or for interaction effects.

Significant differences in mean high school rank were found for men and women and for aid recipient-employment groups (Table 10). Data for high school rank are expressed as standard scores (see Appendix C).

* Analyses were computed using the ANOVES program for two-way analysis of variance, or KRWAL for one-way analysis of variance of ordinal data. These programs were written for the Computation Center of the Pennsylvania State University.

Women ranked higher in their class than men, and employed men ranked higher than non-employed men. Among women, non-employed aid recipients ranked lowest. Interaction effects were not significant, but were apparent.

Fathers' mean educational levels ranged from 10.30 to 12.39 year. Differences were significant for aid-employment groups (Table 11). Aid recipients of both sexes had lower levels of fathers' education than did non-recipients. Similarly, the family income levels of aid recipients for both sexes were significantly lower than those of non-recipients (Table 12). Mean family incomes for recipients ranged from $5737 to $6386, while those for non-recipients ranged from $9958 to $12,009. A significant difference in fathers' occupational levels was found among aid recipient-employment groups for men, but not for women (Table 13). These occupations were ranked in the following order: professional, managerial and office, semiprofessional and technical, sales, clerical, skilled, service, semiskilled and unskilled, and unemployed. Among men, father's occupational levels for non-recipients were higher than for recipients. Although not significant, the same tendency was noted for women. These findings for family income and educational and occupational levels of fathers show a strong tendency for grants and loans to be awarded to students from low socio-economic backgrounds.

Financial Aid Amounts and Employment Earnings

The first hypothesis was concerned with student characteristics. A supplementary hypothesis, similar to the first one but related to financial aid and employment variables, can be stated: There are no differences between relevant groups A, B, C, and D in terms of the amounts of grants, loans, employment earnings, and certain combinations of these. No differences in scholarship amounts to aid recipients by sex or by employment status were noted (Table 14). Amounts ranged from a low of $382 for non-employed women to a high of $461 for non-employed men. For loan amounts, a significant difference was found between non-employed and employed recipients, and the difference in loan amounts between men and women recipients was nearly significant (Table 15). Non-employed recipients received loans of $794 and $477 for men and women, respectively, and employed recipients received lesser loan amounts of $506 and $412 for men and women, respectively. For combined scholarship-loan amounts, a significant difference between men and women was found, with men receiving greater amounts (Table 16). While not significant, differences between non-employed and employed groups were also suggested. Combined amounts for non-employed and employed men were $845 and $541, respectively. Combined amounts were lower for women, $482 and $449 for non-employed and employed recipients, respectively.

A significant difference in employment earnings by men and women was found, and the difference between aid recipients and non-recipients closely approached significance (Table 17). Earnings by men were $1010 and $1385 for aid recipients and non-recipients, respectively. Earnings

for women were much lower, $503 and $622 for aid recipients and non-recipients, respectively. Both men and women non-recipients had higher employment earnings than did aid recipients.

A t-test was computed to test the difference in combined financial aids and employment earnings between employed men and women recipients (Table 18). Combined mean amounts were significantly higher for men than for women, $1551 and $955, respectively.

Relationships Between Predictor Variables and Aid and Employment Amounts

The second hypothesis was stated: There are no relationships among the several types of aid and employment and the several predictor variables of personal, academic, and socio-economic characteristics. This hypothesis was tested using multiple linear regression analysis. This procedure selects the single variable with the highest predictive value and continues to select new variables that will maximally increase the explained variance when they are used together as predictors. The program computes step-wise multiple regression equations, adding one variable at a time until there are no variables remaining which add significantly to the explained variance.* Intercorrelation matrices and results of the multiple regression procedure were completed separately for men and women for each of the three groups who either received financial aid or who were employed. A restricted model for the multiple regression analysis was used, one that eliminated all aid or employment variables and included only the personal and background variables.

Non-employed aid recipients. Tables 19 and 20 show intercorrelations among personal variables and financial aid amounts and the results of the multiple regression analyses for non-employed men and women aid recipients, respectively. For men, only the ACT Composite score was included in the prediction equation for scholarship amounts and for loan amounts, separately. ACT score was positively correlated to amounts of scholarship award and negatively correlated to amounts of loans. For women, none of the personal variables remained in the prediction equations for scholarships, loans, and combined amounts.

Employed aid recipients. Tables 21 and 22 show intercorrelations and the results of the multiple regression analyses for employed men and women aid recipients, respectively. For men, only for loan amounts were any personal variables included in the prediction equation; age was positively correlated with loan amounts.

For women, aid and employment amounts were more predictable. For scholarship amounts, ACT score was negatively correlated. For loans, four factors appeared in the prediction equation: age, high school rank,

* The procedure was conducted using the UPREG program, written for the Computation Center at the Pennsylvania State University.

fathers' educational level, and family income. Students from higher income families and older students tended to receive larger loan amounts, and students who ranked high in their high school class and those whose fathers had high educational levels tended to receive lower loan amounts. For combined scholarship and loan amounts and for combined amounts of scholarships, loans, and employment, women with low ACT scores tended to receive or earn higher amounts.

All aid recipients. Tables 23 and 24 contain intercorrelations and results of the multiple regression analyses for financial aid amounts received by all men and women recipients, respectively. For men, low income levels and high ACT scores were related to higher scholarship amounts, and low levels of fathers' education were related to higher loan amounts.

For women, no factors were included in a prediction equation for scholarship amounts. But higher loan amounts were associated with higher family incomes, lower ACT scores, lower high school rank, and lower levels of fathers' education. For combined scholarship and loan amounts, lower ACT scores were related to higher amounts of combined aid.

Employed non-recipients. Tables 25 and 26 contain intercorrelations and results of multiple regression analyses for employment amounts earned by men and women, respectively, who received no financial aids. Older men tended to have had higher employment earnings than younger men. Women with fathers having lower educational levels tended to have had higher employment earnings.

All employed students. Tables 27 and 28 contain intercorrelations and results of multiple regression analyses for employment amounts earned by men and women, respectively, regardless of whether they received financial aid. For men, no factors were included in a prediction equation for employment earnings. For women, students whose fathers had lower educational levels tended to have had higher employment earnings.

Educational Outcomes

The third hypothesis was stated: There are no differences between groups A, B, C, and D in terms of their levels of academic achievement and persistence at the community college as measured separately by the several criteria of academic retention and achievement. These criteria included (1) total credit hours earned, (2) cumulative grade-point average, (3) associate degree or certificate earned, (4) associate degree or certificate, or transfer directly to a four-year college without a degree, and (5) continuous enrollment for four consecutive semesters.

Between-group differences were tested first by two-way analyses of variance and then by analyses of covariance, separately for men and women, using high school rank and family income as covariates. Differences

for the remaining criterion variables were tested by chi-square, separately for men and women.*

Mean values for credit hours earned ranged from a low of 42.9 to a high of 55.7, and differences were not significant for sex, aid-employment groups, or interaction (Table 29). Significant differences between groups by sex and by aid-employment status were found for grade-point average (Table 30). Women earned higher grades than men. Among men, employed recipients earned higher grades than other groups. Among women, non-employed recipients appeared to earn the lowest grades. Thus, there was no clear advantage for aid recipients over non-recipients in credit hours earned or grade-point average.

In the analysis of covariance, expectedly, no significant difference between aid recipient-employment groups was found for credit hours earned by either men or women (Tables 31, 32). Also, for grade-point average, no significant difference between groups was found for either men or women (Tables 33, 34). Thus, the significant difference among aid recipient-employment groups in the analysis of variance (Table 30) has disappeared with the adjustments for the covariates.

Table 35 contains the frequency distributions and chi-square values for earning an associate degree or certificate by the several aid recipient-employment groups. Overall, 36 percent of the men and 47 percent of the women earned degrees or certificates. The distribution across groups was significant for women but not for men. For women, employed aid recipients had the highest rate of graduation; but non-employed aid recipients had the lowest, so there was no apparent advantage for aid recipients. For men, although the difference was not significant, both aid recipient groups had higher rates of graduation than did the non-recipient groups.

Since a large number of community college students are known to transfer to four-year institutions before earning the associate degree, a second measure of academic success is the combined rate of graduation or transfer directly from the community college without the degree. Table 36 shows the frequency distributions and chi-square values for this combined criterion. Overall, 58 percent of the men and 61 percent of the women earned degrees or certificates or transferred without degrees. Differences between groups were not significant for men or women, but for men, both non-employed and employed aid recipient groups had higher rates of success than the non-recipient groups, 62 and 68 percent, compared to 51 and 51 percent. For women, no advantages for aid recipient groups were apparent.

Continuous enrollment at college over a period of time is one measure of academic persistence. Table 37 shows the frequency distributions and chi-square values for continuous enrollment over a four-semester period by several groups. Overall, 59 percent of the men and

* Programs used were ANOVES, COV, and FAWCS, written for the Computation Center of the Pennsylvania State University.

66 percent of the women maintained continuous enrollment. Differences were significant for women, but not for men. For women, employed aid recipients showed a clear superiority over the other groups. Eighty-five percent were continuously enrolled, compared to 66 percent overall. For men, although the results were not significant, aid recipient groups had an apparent superiority over non-recipient groups. Sixty-six percent of each recipient group, compared to 57 and 52 percent of the non-employed and employed non-recipients, were continuously enrolled.

An attempt was made to compute chi-square for distributions separate for two levels of high school rank and two levels of family income. Ranges for the two income groups were $6000 and over, and under $6000. Ranges for the high school achievement groups included the upper two fifths, and the lower three fifths. Table 38 contains selected results for the several distributions by high school rank, family income, and sex; for the three educational outcome variables of degree earned, degree earned or direct transfer without degree, and continuous enrollment. For 11 of 24 distributions, cell frequencies were too low to assure reliability of findings, and possible differences in outcomes across levels of high school rank and family income were obscured. Only 1 of 13 remaining distributions were found to contain significant differences between groups.

In all, little information was obtained from the distributions in which respondents were grouped by high school rank and income level to add to that provided by the distributions in which all men and all women were grouped. The accumulation of data on Table 38 suggests that the employed recipient group (B) was usually the most successful of the four aid-employment groups in educational outcomes. The accumulated data suggest that both men and women in the high achievement level were more successful than those in the low achievement level. And men in the low income level appeared to be more successful than women in the low income level. Overall, women appeared to be more successful than men.

In sum, there was little firm evidence of interaction of outcomes across aid recipient groups and high school achievement levels or across aid recipient groups and family income levels.

Employment Findings

Extent of employment is reported in this section in terms of number of hours worked per week and percentage of students who were employed. (Employment earnings were reported earlier in this chapter.)

Men worked significantly more hours during their freshman year (1967-68) than did women (Table 39). Men recipients and non-recipients worked 21.7 and 24.8 hours per week, respectively; and women recipients and non-recipients worked 13.4 and 14.9 hours per week, respectively. While differences between non-recipients and recipients were not significant, both men and women non-recipients worked more hours than men and women recipients. For the students' second year at college (1968-69),

employment hours were significantly different by sex and by aid-employment groups (Table 40). Men recipients and non-recipients worked 21.4 and 26.5 hours, respectively, and women recipients and non-recipients worked 13.6 and 18.4 hours, respectively. A comparison of employment during the students' first and second years revealed no change in hours worked for aid recipients, but non-recipients appeared to work slightly more hours during their second year.

The percentage of students who worked part time is of importance in evaluating extent of employment. About three-fifths of all men and one-half of all women held jobs while they were enrolled as full-time freshman students (Table 41). Both men and women aid recipients held jobs proportionally as often as non-recipients.

Employed subjects were asked to indicate the degree of necessity of employment for meeting educational expenses by choosing one of five choices in equal increments from 100 percent down to zero percent. Responses of analysis of variance were not significant for sex, aid-employment group, or interaction, but women non-recipients reported a lower degree of necessity than other groups (Table 42). Overall, the respondents reported that 75 percent of the reason for employment was to meet educational expenses and 25 percent was for other reasons.* Women non-recipients indicated that about 67 percent of the reason was to meet educational expenses and 33 percent was for other reasons.**

Opinions About Financial Aids

Subjects were asked to provide their opinions about several aspects of receiving financial aids. Aid recipients, only, were asked to respond to two questions about the personal necessity of receiving financial aid and the advantages which accrued from their receiving financial aid. All subjects were asked to respond to a question about social or personal obligations which result from acceptance of financial aid.

Table 43 shows the distribution of aid recipients' opinions about the personal necessity of receiving financial aid. Respondents were asked to check the statement most applicable to themselves. Nearly all aid recipients of both sexes stated that receiving financial aid helped them to avoid one of the following: financial hardship, taking a reduced load, or not attending college. Only six percent of the men and four percent of the women noted that they had had little or no need for the aid.

Table 44 shows the results of aid recipients' opinions about a list of five possible advantages of receiving aid. The respondent was

* Mean response values of about 2.00 were reported, and these correspond to reason for employment as 75 percent necessary to meet educational and related expenses and 25 percent for other reasons. See Appendix B.

** A mean value of 2.34 converts as follows: 75 - .34 (75 - 50) = 67 percent necessary to meet educational and related expenses.

asked to check each statement which applied. Just 20 percent of the men and 16 percent of the women noted that "receiving financial aid made little or no difference to my success as a student." Specific advantages noted, in descending order of their frequency and with respective percentages of men and women respondents, were (1) carry a full-time academic load (52 percent and 62 percent), (2) plan for additional years of college (47 percent and 43 percent), (3) allowed more time to study (35 percent and 45 percent), and (4) allowed more participation in co-curricular activities (14 percent and 14 percent). Men and women recipients agreed generally in their responses, but more women than men noted "carry a full-time academic load" and "more time to study." There were no significant differences between non-employed and employed aid recipients, separately for men and women. While the differences were not significant, among women, employed recipients more than non-employed recipients noted an advantage of "additional years of college," 52 percent and 32 percent, respectively.

Table 45 shows the responses of all subjects to the existence of a personal or social obligation which results from acceptance of financial aid. About one-half of the men and women noted that a special obligation does result from accepting financial aids. There were no significant differences among the aid-employment groups for either men or women.

Discussion

This section contains a re-statement of the four research questions toward which this study was directed, along with relevant findings. Also, several additional comments are provided regarding financial aids at community colleges. A summary of mean values for personal, academic, and socio-economic characteristics and for amounts of aid and employment earnings is contained in Table 46. This summary may assist the reader in understanding some of the descriptive findings of the study.

Summary of Findings

1. What are the personal, academic, and socio-economic characteristics of aid recipients, and how do these compare to characteristics of non-recipients? Recipients of scholarships and loans were found to have had lower socio-economic backgrounds than non-recipients, as measured by father's education, family income, and father's occupational level. These findings suggested that whether or not a student received financial aid depended to some extent on family need.

2. Are scholarships and grants, loans, and employment given to students who are most needy, most capable, or to those with some combination of need and ability? What combination of these and other factors applies? It was shown that recipients of scholarships and loans were more needy in terms of family background. Generally, the academic ability of recipients and non-recipients did not differ, although some variations appeared in high school rank for employed and non-employed recipients.

There were few differences in amounts of aid and employment among the study groups. Non-employed aid recipients received higher loan amounts than employed aid recipients, showing some tendency for either loans or employment earnings to be used for meeting educational and related living expenses. Comparing men and women aid recipients, it was found that men had received higher scholarship-loan amounts, had higher employment earnings, and had obtained higher combined aid and employment amounts. Men students apparently have greater personal and related expenses than do women, possibly because women receive greater support from their families, or because our culture imposes more personal expenses upon men.

A number of personal and background factors were related to amounts of financial aid and employment earnings. Recipients who received larger scholarship amounts earned higher ACT scores and, to a lesser extent, had low family incomes. Larger loan amounts were related to low ACT scores, low high school rank (for women), higher age, high family income, and low father's education. Apparently, larger scholarship amounts were given to recipients who earned high ACT scores while recipients with lower ACT scores and rank in school class were given larger loans. While

it is likely that scholarship amounts for the recipients were dictated by the awarding agencies, it is also likely that the recipients or their parents influenced the amounts of loans that were granted, as loans from several major sources have been available for several years to students as a part of a broad range of financial aid.

Little variance in employment earnings was accounted for by the several personal and background variables. However, a tendency was noted for students from low educational backgrounds and for older students to have higher employment earnings. Apparently, a greater-than-usual proportion of educational expenses were met through employment by older students and by students from low educational backgrounds.

3. What are the employment patterns of community college students? Three-fifths of the men students and one-half of the women students, all of whom were enrolled full time, held jobs during their freshman year. For both men and women, recipients of financial aid were employed as often as were non-recipients. Men worked from between 22 and 25 hours per week, and women worked from 13 to 15 hours per week. Employment hours were the same during the students' second year of college as during the first year.

Family incomes for employed students were the same as for non-employed students, although employed aid recipients had lower family incomes than employed non-recipients. There was some evidence, although non-significant, that employed women had lower family income levels than non-employed women. Thus, it appears that employment was independent of family income, especially for men.

4. Do financial aids make a difference in student achievement and persistence? Are certain types of aids more "potent" than others? Certain differences between aid recipient-employment groups were noted from procedures which did not attempt to hold constant the effects of high school rank and family income, but these differences largely disappeared when high school rank and income were held constant. The hypothesis which asserted no difference between financial aid-employment groups in educational outcomes was accepted. However, the accumulation of findings suggested that aid recipients who were employed were generally the most successful of all groups.

It must be remembered that aid recipients in this study had significantly lower socio-economic backgrounds than did non-recipients, and other studies have shown that students from low socio-economic backgrounds tend to be less successful or persistent in college. Therefore, our findings that aid recipients were at least as successful as were non-recipients indicate some probable benefits of financial aids to educational outcomes.

The question of whether certain types of aids are more potent than others in relation to educational outcomes could not be answered, as aid recipients of scholarships and loans were grouped together.

Other findings. Based on the opinions of aid recipients, financial aids had a definite value in enabling students to attend college. Only about five percent noted that they had little or no need for the aid. Most recipients noted specific advantages to their education which resulted from their receiving aid; under 20 percent indicated that the financial aid made little or no difference in their success as students.

Other studies have found that community college students are not as academically inclined as students at four-year colleges. Therefore, their extensive employment might be viewed as evidence of need for non-academic experiences. But students claimed that the mean proportion of employment for meeting educational expenses was about three-fourths, and other reasons for employment comprised the remaining one-fourth. Thus, it appears that the primary reason for employment by community college students was to support themselves as students.

Additional Comments

This study is essentially a post hoc description of how financial aids were awarded to students at selected community colleges and of relationships between aids and educational outcomes. Much remains to be learned about how financial aids can be used maximally to increase educational opportunity for students having various levels of need. Also, the growing demand for accountability of educational services will soon reach the operation of the college financial aid office. To meet this demand, financial aid officers must develop records of transactions which will support evaluations of their aid practices.

This study showed that aid recipients, despite their socio-economic handicap, were as successful academically as non-recipients who were more affluent and culturally advantaged. However, future studies might include a more appropriate "control" group, (1) by including subjects of similar financial need, but who did not receive financial aid, and (2) by retaining subjects in both groups who did not enroll at college, as well as those who did. Such procedures would allow a broader assessment of educational outcomes than was possible in this study, and unintended differences in personal and background variables between the recipient and control group would be eliminated. Of course, the focus of such a study might shift from a collegiate institution to an entire group of high school seniors. It should contribute much to learning how effective financial aids are in promoting education beyond high school for needy youth.

Educators responsible for two-year colleges generally view financial aids to their students as a necessity. In view of the consensus about the need for aid, it is difficult to understand why more research about the need and effectiveness of these aids has not been carried out. Possibly educators have been lulled into a sense of security as a result of the increasing availability of financial aid funds over the past decade.

Now, despite the growing numbers of disadvantaged students attending community colleges, it is apparent that state legislators do not share with community college educators the before-mentioned consensus about student aids. It is increasingly necessary for personnel at individual colleges to evaluate carefully how their student aid programs contribute to learning outcomes for students from low-income backgrounds.

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APPENDIX A

SURVEY OF FINANCIAL AIDS TO STUDENTS
AT PENNSYLVANIA COMMUNITY COLLEGES

Procedures for Selecting Student Samples
December, 1970

1. Financial aid recipients. The aid recipient sample group should include all students at your institution who matriculated during the summer or fall 1967, who were full-time students (enrolled in 12 or more credits) during the fall 1967, and who received $100 or more in financial assistance as known in the financial aid office, either grant or loan, from any source, during the 1967-1968 year.

2. Non-recipients. A comparable student group should be chosen to include students who were matriculated during the summer or fall 1967, who were full-time students during the fall of 1967 (enrolled in 12 or more credits), and who received less than $100 in financial assistance in either grants or loans during the 1967-1968 year. The control group should be randomly selected, to contain 25 percent more persons than are in your aid recipient group.

This sample should be drawn from the lists of matriculants for the summer and fall 1967 sessions. The proportions to be drawn from the summer and the fall sessions should be equal to those proportions present in the financial aid sample.

Suggestions for selecting the control group follow. First, remove (or cross out) all persons previously noted as an aid recipient from the matriculant list. If n persons are to be drawn from a remaining list of N matriculants, every N/nth person should be selected. For example, if we want 200 persons from a group of 1600 matriculants, every 8th name should be selected. If we want 200 persons from a group of 1700 matriculants, we should select the 8th person, the next 9th (17th), the next 8th (25th), and so forth. If we want 210 persons from a list of 1600 matriculants, we might first choose every 8th person and then choose the remaining 10 persons in some random fashion. Please call Fred Snyder, person-to-person and collect, if there is any question about the procedure to be followed.

APPENDIX A

SURVEY OF FINANCIAL AIDS TO STUDENTS
AT PENNSYLVANIA COMMUNITY COLLEGES
December, 1970

General Instructions

Complete one Data Form for each student to be included in the study. Specific instructions for filling out the Data Form are shown below. Of course, the financial aid information as requested in #19 to #21 can be supplied only for aid recipients.

1. Student ID project number, assigned at H.A.C.C.

2. Student name. Last name, first name MI. Please print clearly.

3. Student's address.

4. Parents' address. Parental information will allow follow-up where envelopes are undeliverable to students.

5. Year of birth. 00 thru 99.

6. Sex. 1-male, 2-female.

7. Marital status on September 1, 1967. 1-single, 2-married, 3-other (divorced, widowed, etc.), 4-unknown.

8. College curriculum per most recent records at the community college. 1-career, 2-transfer, 3-others (explain).

9. ACT composite score. 01 through 36.

10. High school rank in class. Quintile desired. Upper fifth-63, 2nd fifth-55, middle fifth-50, 4th fifth-45, lower fifth-37. If quintiles are not available, show the position of student in class. Example: 227/471.

11. Income for dependent students. Show 1966 family income per college records. This data must come only from the financial aid records and will be available for aid recipients only.

12. Income for independent or married students. Show estimated personal income, or if married, combined income during 1967, per financial aid records only. Will be available for aid recipients only.

13. Associate degree or certificate (one year's work or more) in approved program earned by June 30, 1970. 1-associate degree, 2-certificate, 3-neither.

14. Enrolled at the community college during the fall 1968 semester. 1-yes, carried 12 credits or more, 2-yes, carried under 12 credits, 3-no.

15. Continuous enrollment through two academic years of 1967-1968 and 1968-1969, either full time or part time, not counting summers. 1-yes, 2-no.

APPENDIX A

-2-

16. Was the student a transfer from a college prior to enrolling at the community college? 1-yes, 2-no.

17. Total credit hours earned at the community college through June 30, 1970. 00 thru 99.

18. Cumulative grade point average earned at the community college through the last semester of attendance or June 30, 1970. 0.00 through 4.00.

19-21.
Financial aids and employment earnings. Supply this information from your records, even though you know they may be incomplete. Refer to the list of sources and code numbers below. Of course, this information can be supplied only for aid recipients. Show totals as indicated and write in None for non-recipients.

Scholarships and Grants

1 Pennsylvania Higher Education Assistance Agency Scholarship
2 Federal Economic Opportunity Grant (EOG)
3 Other Federal grants (exclude veterans and dependents' benefits)
4 Community college funds
5 Grants from other public sources (Vocational Rehabilitation, others)
6 Grants from private sources
7 Other (please explain on Data Form)

Loans

8 Pennsylvania Higher Education Assistance Agency Loan
9 National Defense Student Loan
10 Loan from community college funds
11 Loan from public sources (other than above)
12 Loan from private sources
13 Other (please explain on Data Form)

Employment

14 College Work-Study (CWS), Federally Sponsored
15 Other employment at the community college
16 Assigned cooperative employment as part of curriculum
17 Other employment not at the community college

SURVEY OF FINANCIAL AIDS TO STUDENTS AT PENNSYLVANIA COMMUNITY COLLEGES
January, 1971

Dear Alumnus:

This questionnaire is designed to provide information for a study of financial aids to students at Pennsylvania community colleges. To complete the study, we must have information which only you, a former community college student, can provide. You are asked to answer questions about your background, financial aids you received, part-time employment as a student, and certain opinions. Both non-recipients and recipients of financial aids should complete this questionnaire.

Your responses will be summarized with those of others, so no individual will be identified. No agency, public or private, will have access to an individual's responses. Please answer each question! Estimate any answers you are not sure of, but try to answer each question as honestly as possible.

Please complete the questionnaire within three days, if possible. We have provided a pre-addressed stamped envelope for your convenience. Thanks very much for your help.

INSTRUCTIONS. ANSWER MOST QUESTIONS BY WRITING THE APPROPRIATE NUMBER IN THE BLANK SPACE TO THE LEFT OF EACH QUESTION.

___1. Your marital status on September 1, 1967.

1 Single
2 Married
3 Other (divorced, widowed, etc.)

___2. Please note your outcome from attending the community college.

1 I earned an associate degree or certificate.
2 I transferred directly to another college before earning an associate degree.
3 Other (please state) _____

___3. Show the number of years' schooling which your father or male guardian completed by writing the correct number of 0 through 20. (Allow 17 or 18 years for a master's degree and 19 or 20 years for a doctor's degree.)

4. ON THE REVERSE SIDE OF THIS SHEET, IN PARTS A, B, AND C, SHOW THE SOURCES AND AMOUNTS OF SCHOLARSHIPS OR GRANTS, LOANS AND EMPLOYMENT EARNINGS WHICH YOU RECEIVED DURING YOUR ENROLLMENT AT THE COMMUNITY COLLEGE. SHOW THE SOURCES BY USING THE CODE NUMBERS NEAR THE TOP OF THE PAGE. ESTIMATE AMOUNTS TO THE NEAREST $50.

(PLEASE CONTINUE ON REVERSE SIDE)

ILLUSTRATION. Assume you received two scholarships or grants that need not be repaid: $200 from community college funds and $300 from a private source. Also, assume you had $200 earnings from a private employer during the academic year. You would complete the form as noted, using code numbers shown below.

Scholarship or Grant		Loan		Employment Earnings	
Source	Amount	Source	Amount	Source	Amount
2	$ 200		$	17	$ 200
6	300				
Total	$ 500	Total	$ None	Total	$ 200

Scholarships and Grants

1 Pennsylvania Higher Education Assistance Agency Scholarship
2 Federal sources, community college funds, and other public sources (do not include benefits to GI's and war orphans)
6 Grants from private sources (churches, clubs, businesses. etc.)
7 Other (please list here) _____

Loans

8 Pennsylvania Higher Education Assistance Agency Loan
9 National Defense Student Loan (NDSL or NDEA)
10 Loans from community college funds and other public sources other than #8 and #9
12 Loan from private sources
13 Other (please list here)

Employment

14 College Work-Study (CWS), Federally Sponsored
15 Other employment at the community college
16 Assigned cooperative employment as part of curriculum
17 Other employment not at the community college

IN PART A, SHOW INFORMATION WHICH APPLIED TO THE FALL AND SPRING SEMESTERS OF 1967-1968 ONLY. IN PART B, SHOW INFORMATION ABOUT AIDS APPLIED TO SUMMER COLLEGE ATTENDANCE OR EARNINGS DURING SUMMER MONTHS. PROVIDE INFORMATION FOR PARTS B AND C ONLY IF YOU WERE ENROLLED AT THE COMMUNITY COLLEGE FULL TIME OR PART TIME DURING THE FALL 1968 SEMESTER.

A. 1967-1968 Academic Year (exclude summer earnings)

Scholarship or Grant		Loan		Employment Earnings	
Source	Amount	Source	Amount	Source	Amount
	$		$		$
Total	$	Total	$	Total	$

B. Summer 1968 (only)

Scholarship or Grant		Loan		Employment Earnings	
Source	Amount	Source	Amount	Source	Amount
	$		$		$
Total	$	Total	$	Total	$

C. 1968-1969 Academic Year (exclude any summer earnings)

Scholarship or Grant		Loan		Employment Earnings	
Source	Amount	Source	Amount	Source	Amount
	$		$		$
Total	$	Total	$	Total	$

(IN PARTS A, B, AND C, INDICATE NONE IN EACH SPACE FOR TOTALS WHERE YOU HAVE RECEIVED NO AMOUNT IN THAT CATEGORY.)

__5. From the list below, write the occupational level of your father or male guardian in 1967 or just prior to his death or retirement.

1 Clerical (bank teller, cashier, secretary, telephone operator, etc.)
2 Managerial and office (bank officer, buyer, purchasing agent, store manager, etc.)
3 Professional (CPA, dentist, engineer, librarian, teacher or professor, etc.)
4 Sales
5 Semiprofessional and technical (draftsman, dental technician, engineering technician, surveyor, etc.)
6 Semiskilled and unskilled (assembler, service station attendant, truck driver, etc.)
7 Service (barber, beauty operator, policeman, practical nurse, etc.)
8 Skilled (mechanic, machinist, bricklayer, carpenter, electrician, repairman, welder, other tradesmen, etc.)
9 Unemployed
10 Unknown

IN QUESTIONS #6 AND #7, SHOW HOW MANY HOURS PER WEEK YOU WERE EMPLOYED WHILE A STUDENT AT THE COMMUNITY COLLEGE. WHILE THIS MAY HAVE FLUCTUATED DURING THE YEAR, PLEASE DEVELOP AN AVERAGE FIGURE AS YOUR ANSWER. SHOW A ZERO (0) IF YOU WERE NOT EMPLOYED.

___ hrs 6. 1967-1968 academic year (do not include summer employment).

___ hrs 7. 1968-1969 academic year (Answer only if you were enrolled during this year. Do not include summer employment.)

___ 8. If you were employed while a student at the community college, what proportion of the two reasons (listed below) was most appropriate for your employment?

	Necessary to meet educat'l and related personal exp.		Not necessary, but I worked for other reasons
1	100%	and	0%
2	75%	and	25%
3	50%	and	50%
4	25%	and	75%
5	0%	and	100%

___ 9. If you received a grant (scholarship) or loan while a student at the community college, write the number of the statement which most accurately reflects your feelings.

1 I could not have attended college without the grant or loan.
2 I would have had to take a reduced academic load without the grant or loan.
3 I could have attended the college full time without the grant or loan, but only with considerable financial hardship to me or my family.
4 I could have attended the college full time without the grant or loan with little or no financial hardship to me or my family.
5 I didn't need the grant or loan.

(PLEASE CONTINUE ON REVERSE SIDE)

10. If you received financial aid as a community college student, please check (X) each statement which is quite true for you.

___a. Receiving financial aid made little or no difference to my success as a student.
___b. It allowed me to plan for additional years of college.
___c. It allowed me to carry a full-time academic load.
___d. It allowed me more time to study.
___e. It allowed me to participate more in co-curricular activities at the college.
___f. Other (please specify) _____

IN QUESTIONS #11 AND #12, BE SURE TO PROVIDE YOUR BEST ESTIMATE, EVEN IF YOU ARE UNSURE. PLEASE DO NOT SKIP THESE QUESTIONS. BEAR IN MIND THAT YOUR ANSWERS WILL NOT BE IDENTIFIED WITH YOU AS AN INDIVIDUAL.

$_____ 11. If you were single or dependent upon your parents or guardians on September 1, 1967, show the combined income of your parents during the 1966 calendar year. Include income such as social security, unemployment benefits, other insurance benefits. Estimate the total income to the nearest $100.

$_____ 12. If you were married or totally independent from your parents as of September 1, 1967, show the combined income for yourself and your wife/husband earned during 1967. Include income such as social security, unemployment benefits, benefits from the GI bill to veterans and war orphans. Estimate the total income to the nearest $100.

___13. Do you feel that acceptance of financial assistance by a student to meet educational expenses places upon him or her any special social or personal obligation? Write the appropriate number in the blank space on the left to indicate your answer.

1 Yes
2 No
___ If you wish, explain your feelings here _____

_____

14. Thank you for completing this questionnaire. Add any comments below.

APPENDIX C

TABLE FOR CONVERTING
HIGH SCHOOL CLASS RANK
TO STANDARD SCORE

Rank in Class, Quintiles	Standard Score
Upper fifth	63
Second fifth	55
Middle fifth	50
Fourth fifth	45
Lowest fifth	37

DATA FORM, FOR AID RECIPIENTS AND NON-RECIPIENTS

_____ I.D.

_____ (student name)

_____ (street address)

_____ (city, state, zip)

_____ (parents' street address)

_____ (parents' city, state, zip)

___ 5. Year of birth

___ 6. Sex

___ 7. Marital status

___ 8. College curriculum

___ 9. ACT Composite Score

_____ 10. High school rank in class

$ _____ 11. 1966 family income

$ _____ 12. 1967 combined income

___ 13. Assoc. degr/cert. earned

___ 14. Fall 1968 enrollment

___ 15. Enrollment continuous

___ 16. Transfer student (prior)

___ 17. Credit hours, total

_____ 18. Grade point average, cum.

19. 1967-1968 Academic Year

Grant or Scholarship		Loan		Employment Earnings	
Source	Amount	Source	Amount	Source	Amount
_____	$ _____	_____	$ _____	_____	$ _____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
Total	$ _____	Total	$ _____	Total	$ _____

20. Summer 1968

Grant or Scholarship		Loan		Employment Earnings	
Source	Amount	Source	Amount	Source	Amount
_____	$ _____	_____	$ _____	_____	$ _____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
Total	$ _____	Total	$ _____	Total	$ _____

21. 1968-1969 Academic Year

Grant or Scholarship		Loan		Employment Earnings	
Source	Amount	Source	Amount	Source	Amount
_____	$ _____	_____	$ _____	_____	$ _____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
Total	$ _____	Total	$ _____	Total	$ _____

(For #19 through #21, indicate None in spaces for totals where no amounts were granted or earned.)

Appendix E

TABLE 6
MEANS AND VARIANCES FOR PERSONAL AND ACADEMIC CHARACTERISTICS OF RESPONDENTS AND NON-RESPONDENTS TO THE QUESTIONNAIRE

	Age		
	Mean	N	Variance
Respondents	20.05	306	54.91
Non-Respondents	19.09	227	15.82
t=1.92			

	ACT Composite Score		
	Mean	N	Variance
Respondents	18.52	199	20.12
Non-Respondents	16.87	151	20.64
t=3.38*			

	High School Rank		
	Mean	N	Variance
Respondents	51.75	269	60.09
Non-Respondents	49.31	208	71.57
t=3.24*			

	Credit Hours Earned		
	Mean	N	Variance
Respondents	48.49	296	408.98
Non-Respondents	37.46	207	478.11
t=5.74*			

	Grade-Point Average		
	Mean	N	Variance
Respondents	2.19	296	0.48
Non-Respondents	1.82	207	0.63
t=5.41*			

$t_{.975}=1.96$

*indicates significance

TABLE 7
FREQUENCY DISTRIBUTIONS FOR PERSONAL AND ACADEMIC CHARACTERISTICS OF RESPONDENTS AND NON-RESPONDENTS TO THE QUESTIONNAIRE

	Sex			Marital Status		
	Male	Female	Total	Single	Other	Total
Respondents	170	136	306	277	20	297
Non-Respondents	148	79	227	198	15	213
Total	318	215	533	475	35	510
	Chi-sq.=5.035*, p=.025			Chi-sq.=0.018, p=.892		

	Type of Curriculum			Degree or Certificate Earned		
	Career	Trans.	Total	Yes	No	Total
Respondents	92	198	290	126	180	306
Non-Respondents	77	143	220	46	181	227
Total	169	341	510	172	361	533
	Chi-sq.=0.606, p=.436			Chi-sq.=26.076*, p-.000		

	Continuous Enrollment			Prior Transfer Status		
	Yes	No	Total	Yes	No	Total
Respondents	191	115	306	25	281	306
Non-Respondents	89	138	227	11	216	227
Total	280	253	533	36	497	533
	Chi-sq.=28.157*, p=.000			Chi-sq.=2.286, p=.131		

$\text{Chi-square}_{.975, df=1} = 5.02$

*Indicates significance

TABLE 8
MEANS, VARIANCES, AND ANALYSIS OF VARIANCE FOR AGE OF SUBJECTS GROUPED BY SEX AND AID RECIPIENT-EMPLOYMENT STATUS

Means and Variances

	Source	Mean	N	Variance
A	Men	19.24	29	31.33
	Women	20.86	37	90.12
B	Men	21.24	50	83.21
	Women	20.15	40	63.36
C	Men	20.38	37	67.13
	Women	19.43	28	31.07
D	Men	19.02	54	4.96
	Women	19.74	31	78.93

Homogeneity of variance:
Chi-square=99.05, p=.000*

Analysis of Variance

Source	Sums of Squares	DF	Mean Squares	F	Probability
Sex	0.08	1	0.08	0.001	0.970
Aid-Employ.	88.49	3	29.50	0.531	0.661
Interaction	94.74	3	31.58	0.568	0.636
Error	16556.33	298	55.56		

*Does not meet assumption of homogeneity of variance.

TABLE 9
MEANS, VARIANCES, AND ANALYSIS OF VARIANCE FOR ACT COMPOSITE SCORE OF SUBJECTS GROUPED BY SEX AND AID RECIPIENT-EMPLOYMENT STATUS

Means and Variances

Source		Mean	N	Variance
A	Men	18.53	19	20.93
	Women	17.50	30	23.91
B	Men	19.09	33	24.02
	Women	18.50	24	20.87
C	Men	17.62	21	22.95
	Women	18.63	19	14.02
D	Men	19.27	30	16.89
	Women	18.78	23	17.54

Homogeneity of variance:
Chi-square=2.79, p=.903

Analysis of Variance

Source	Sums of Squares	DF	Mean Squares	F	Probability
Sex	6.02	1	6.02	0.294	0.588
Aid-Employ.	37.10	3	12.37	0.605	0.613
Interaction	25.18	3	8.39	0.410	0.746
Error	3906.12	191	20.45		

TABLE 10
MEANS, VARIANCES, AND ANALYSIS OF VARIANCE FOR HIGH SCHOOL RANK OF SUBJECTS GROUPED BY SEX AND AID RECIPIENT-EMPLOYMENT STATUS

Means and Variances

	Source	Mean	N	Variance
A	Men	48.79	28	47.36
	Women	52.81	32	43.71
B	Men	52.40	43	76.67
	Women	54.69	35	36.28
C	Men	46.31	32	53.38
	Women	55.16	25	42.14
D	Men	50.11	47	50.31
	Women	54.85	27	69.67

Homogeneity of variance.
Chi-square=7.74, p=.356

Analysis of Variance

Source	Sums of Squares	DF	Mean Squares	F	Probability
Sex	1492.6	1	1492.61	20.068	0.000
Aid-Employ.	446.3	3	148.75	2.797	0.041
Interaction	360.1	3	120.02	2.257	0 082
Error	13879.5	261	53.18		

TABLE 11
MEANS, VARIANCES AND ANALYSIS OF VARIANCE FOR FATHERS' EDUCATIONAL LEVEL OF SUBJECTS GROUPED BY SEX AND AID RECIPIENT-EMPLOYMENT STATUS

Means and Variances

	Source	Mean	N	Variance
A	Men	11.82	28	7.56
	Women	11.20	35	11.46
B	Men	10.30	50	7.89
	Women	11.52	40	11.02
C	Men	12.22	36	8.69
	Women	12.39	28	8.47
D	Men	12.06	51	9.46
	Women	12.03	30	4.17

Analysis of Variance

Source	Sums of Squares	DF	Mean Squares	F	Probability
Sex	5.31	1	5.31	0.607	0.437
Aid-Employ.	98.39	3	32.80	3.749	0.011
Interaction	34.55	3	11.52	1.317	0.269
Error	2536.87	290	8.75		

TABLE 12
MEANS, VARIANCES, AND ANALYSIS OF VARIANCE FOR FAMILY INCOME OF SUBJECTS GROUPED BY SEX AND AID RECIPIENT-EMPLOYMENT STATUS

Means and Variances

	Source	Mean	N	Variance
A	Men	5946.55	29	6385729
	Women	6149.71	35	11048976
B	Men	6386.22	49	10949481
	Women	5736.74	39	9259849
C	Men	10908.17	29	17715681
	Women	12008.70	23	37491129
D	Men	10422.27	52	33802596
	Women	9957.50	26	26010000

Homogeneity of variance:
Chi-square=47.76, p=.000*

Analysis of Variance

Source	Sums of Squares	DF	Mean Squares	F	Probability
Sex	472544.	1	472544.	0.025	0.874
Aid-Employ.	1533621001.	3	511207004.	27.322	0.000
Interaction	28937837.	3	9645946.	0.516	0.672
Error	5126745620.	274	18710750.		

*Does not meet assumption of homogeneity of variance.

TABLE 13
DISTRIBUTION OF FATHERS' OCCUPATIONAL LEVELS FOR SUBJECTS, BY SEX AND BY FINANCIAL AID-EMPLOYMENT STATUS

	Males							
	A		B		C		D	
	N	%	N	%	N	%	N	%
Professional	2	10.5	0	0	5	12.2	3	6.1
Managerial and office	3	15.8	5	11.9	6	14.6	13	26.5
Semiprofessional and technical	0	0	1	2.4	1	2.4	3	6.1
Sales	1	5.3	4	9.5	5	12.2	2	4.1
Clerical	3	15.8	2	4.8	1	2.4	2	4.1
Skilled	6	31.6	11	26.2	14	34.1	15	30.6
Service	0	0	3	7.1	2	4.9	2	4.1
Semiskilled and unskilled	3	15.8	14	33.3	6	14.6	6	12.2
Unemployed	1	5.3	2	4.8	1	2.4	3	6.1
Total	19	100.0	42	100.0	41	100.0	49	100.0

	Females							
	A		B		C		D	
	N	%	N	%	N	%	N	%
Professional	3	9.1	1	3.7	8	25.8	1	3.4
Managerial and office	2	6.1	3	11.1	3	9.7	5	17.2
Semiprofessional and technical	0	0	2	7.4	2	6.4	3	10.3
Sales	1	3.0	2	7.4	3	9.7	4	13.8
Clerical	1	3.0	3	11.1	1	3.2	1	3.4
Skilled	14	42.4	8	29.6	10	32.3	8	27.6
Service	2	6.1	2	7.4	0	0	1	3.4
Semiskilled and unskilled	7	21.2	5	18.5	4	12.9	6	20.7
Unemployed	3	9.1	1	3.7	0	0	0	0
Total	33	100.0	27	100.0	31	100.0	29	100.0

Men: H=12.72. P=.005
Women: H=6.32. P=.097

TABLE 14
MEANS, VARIANCES, AND ANALYSIS OF VARIANCE FOR
SCHOLARSHIP AMOUNTS FOR MEN AND WOMEN AID RECIPIENTS

Means and Variances

Source		Mean	N	Variance
A	Men	460.88	24	39916.38
	Women	381.54	28	52963.44
B	Men	405.73	33	64664.33
	Women	421.57	35	44899.66

Homogeneity of variance:
Chi-square=2.00, p=.572

Analysis of Variance

Source	Sums of Squares	DF	Mean Squares	F	Probability
Sex	19314.8	1	19314.8	0.375	0.542
Aid-Employ.	794.9	1	794.9	0.015	0.901
Interaction	66568.7	1	66568.7	1.292	0.258
Error	5975936.7	116	51516.7		

TABLE 15
MEANS, VARIANCES, AND ANALYSIS OF VARIANCE FOR LOAN AMOUNTS FOR MEN AND WOMEN AID RECIPIENTS

Means and Variances

	Source	Mean	N	Variance
A	Men	793.89	9	133961.11
	Women	477.00	15	109506.43
B	Men	505.74	27	99574.43
	Women	412.50	8	104107.14

Homogeneity of variance:
Chi-square=0.28, p=.964

Analysis of Variance

Source	Sums of Squares	DF	Mean Squares	F	Probability
Sex	402418.	1	402418.	3.737	0.058
Aid-Employ.	485851.	1	485851.	4.512	0.038
Interaction	143126.	1	143126.	1.329	0.254
Error	5922464.	55	107681.		

TABLE 16
MEANS, VARIANCES, AND ANALYSIS OF VARIANCE FOR COMBINED LOAN AND SCHOLARSHIP AMOUNTS FOR MEN AND WOMEN AID RECIPIENTS

Means and Variances

Source		Mean	N	Variance
A	Men	845.03	29	1506702.68
	Women	482.11	37	83114.99
B	Men	540.88	50	127363.41
	Women	448.88	40	65880.11

Homogeneity of variance:
Chi-square=126.37, p=.000*

Analysis of Variance

Source	Sums of Squares	DF	Mean Squares	F	Probability
Sex	1664808.	1	1664808.	4.687	0.032
Aid-Employ.	1106014.	1	1106014.	3.114	0.080
Interaction	698573.	1	698573.	1.967	0.163
Error	53989946.	152	355197.		

*Does not meet assumption of homogeneity of variance.

TABLE 17
MEANS, VARIANCES, AND ANALYSIS OF VARIANCE FOR EMPLOYMENT AMOUNTS OF SUBJECTS GROUPED BY SEX AND AID RECIPIENT-EMPLOYMENT STATUS

Means and Variances

Source		Mean	N	Variance
B	Men	1009.96	50	623975.55
	Women	503.38	40	101651.32
D	Men	1384.78	54	1821349.42
	Women	621.74	31	552631.73

Homogeneity of variance:
Chi-square=72.45, p=.000*

Analysis of Variance

Source	Sums of Squares	DF	Mean Squares	F	Probability
Sex	16807965.	1	16807965.	19.466	0.000
Aid-Employ.	3205049.	1	3205049.	3.712	0.056
Interaction	693152.	1	693152.	0.803	0.372
Error	147649675.	171	863448.		

*Does not meet assumption of homogeneity of variance.

TABLE 18
MEANS AND VARIANCES FOR COMBINED SCHOLARSHIP, LOAN, AND EMPLOYMENT FOR MEN AND WOMEN AID RECIPIENTS WHO WERE EMPLOYED

Source	Mean	N	Variance
Men	1550.84	50	923723.32
Women	954.75	40	151510.24

$t_{.975,df=88}=1.99$

t=3.yy> (significant)

TABLE 19

INTERCORRELATION MATRIX AND RESULTS OF MULTIPLE REGRESSION TO EXPLAIN VARIANCE IN AMOUNTS OF SCHOLARSHIPS, LOANS, AND COMBINED AMOUNTS FOR NON-EMPLOYED MALE AID RECIPIENTS

Intercorrelation Matrix

	AGE	ACT	HSR	ED	INC	SCH	LO
ACT	.00						
HSR	.04	-.01					
ED	-.48	.15	-.29				
INC	-.24	.26	-.06	.37			
SCH	-.08	.61	-.08	.13	-.06		
LO	.00	-.72	-.15	-.32	-.06	-.21	
SC-LO	-.02	.03	.11	-.24	.00	.41	.18

Results of Multiple Regression*

Dependent Variables	Independent Variables	Beta	Partial r	R	R^2
Scholarship amts.	ACT-C	.61	.61	.61	.37
Loan amts.	ACT-C	-.72	-.72	-.72	.53
Combined Sc-Lo	(None)				

*In Tables 19 through 28, the existence of a single variable or no variable indicates that only one or none met the criteria for inclusion in the regression equation.

TABLE 20

INTERCORRELATION MATRIX AND RESULTS OF MULTIPLE REGRESSION TO EXPLAIN VARIANCE IN AMOUNTS OF SCHOLARSHIPS, LOANS, AND COMBINED AMOUNTS, FOR NON-EMPLOYED FEMALE AID RECIPIENTS

Intercorrelation Matrix

	AGE	ACT	HSR	ED	INC	SCH	LO
ACT	-.10						
HSR	-.08	.08					
ED	-.15	.00	-.18				
INC	-.06	.16	-.11	.18			
SCH	-.05	.16	-.01	.03	-.18		
LO	-.26	-.17	-.28	-.05	.31	-.53	
SC-LO	-.11	-.14	-.18	-.16	.01	.71	.67

Results of Multiple Regression

Dependent Variables	Independent Variables	Beta	Partial r	R	R^2
Scholarship amts.	(None)				
Loan amts.	(None)				
Combined Sc-Lo	(None)				

TABLE 21
INTERCORRELATION MATRIX AND RESULTS OF MULTIPLE REGRESSION TO EXPLAIN VARIANCE IN AMOUNTS OF SCHOLARSHIPS, LOANS, SCHOLARSHIPS AND LOANS, EMPLOYMENT EARNINGS, AND COMBINED SCHOLARSHIPS, LOANS, AND EMPLOYMENT, FOR EMPLOYED MALE AID RECIPIENTS

Intercorrelation Matrix

	AGE	ACT	HSR	ED	INC	SCH	LO	SC-LO	EM
ACT	-.09								
HSR	.05	.36							
ED	-.27	.16	-.18						
INC	-.07	.48	.08	.48					
SCH	-.15	.12	.14	-.09	-.25				
LO	.37	-.01	.16	-.32	.01	-.22			
SC-LO	.17	.09	.23	-.11	-.02	.53	.93		
EM	.18	-.10	.18	.03	-.04	-.15	.52	.31	
SC-LO-EM	.21	-.05	.23	-.02	-.04	.08	.78	.62	.94

Results of Multiple Regression

Dependent Variables	Independent Variables	Beta	Partial r	R	R^2
Scholarship amts.	(None)				
Loan amts.	AGE	.37	.37	.37	.14
Combined Sc-Lo	(None)				
Employment amts.	(None)				
Combined Sc-Lo-Em	(None)				

TABLE 22

INTERCORRELATION MATRIX AND RESULTS OF MULTIPLE REGRESSION TO EXPLAIN VARIANCE IN AMOUNTS OF SCHOLARSHIPS, LOANS, SCHOLARSHIPS AND LOANS, EMPLOYMENT EARNINGS, AND COMBINED SCHOLARSHIPS, LOANS, AND EMPLOYMENT, FOR EMPLOYED FEMALE AID RECIPIENTS

Intercorrelation Matrix

	AGE	ACT	HSR	ED	INC	SCH	LO	SC-LO	EM
ACT	-.03								
HSR	.00	.39							
ED	.31	.06	.04						
INC	-.28	.28	.17	.01					
SCH	-.12	-.43	.03	-.16	-.19				
LO	.02	-.06	-.50	-.33	.50	.64			
SC-LO	-.12	-.37	.04	-.13	.00	.88	.99		
EM	-.11	-.17	-.24	-.23	.05	.04	-.27	-.13	
SC-LO-EM	-.16	-.42	-.20	-.29	.03	.60	.56	.54	.76

Results of Multiple Regression

Dependent Variables	Independent Variables	Beta	Partial r	R	R^2
Scholarship amts.	ACT	-.43	-.43	.43	.19
Loan amts.	INC	.69	.81	.88	.78
	ED	-.41	-.64		
	HSR	-.60	-.78		
	AGE	.33	.54		
Combined Sc-Lo	ACT	-.37	-.37	.37	.14
Employment amts.	(None)				
Combined Sc-Lo-Em	ACT	-.42	-.42	.42	.18

TABLE 23
INTERCORRELATION MATRIX AND RESULTS OF MULTIPLE REGRESSION TO EXPLAIN VARIANCE IN AMOUNTS OF SCHOLARSHIPS, LOANS, AND COMBINED AMOUNTS, FOR ALL MALE AID RECIPIENTS

Intercorrelation Matrix

	AGE	ACT	HSR	ED	INC	SCH	LO
ACT	-,06						
HSR	.06	.26					
ED	-.33	.14	-.26				
INC	-.10	.42	.05	.42			
SCH	-.14	.28	.03	.05	-.19		
LO	.20	-.24	-.06	-.24	.00	-.18	
SC-LO	.03	.04	.07	-.10	-.02	.38	.41

Results of Multiple Regression

Dependent Variables	Independent Variables	Beta	Partial r	R	R^2
Scholarship amts.	INC	-.37	-.35	.44	.19
	ACT	.43	.40		
Loan amts.	ED	-.24	-.24	.24	.06
Combined Sc-Lo	(None)				

TABLE 24
INTERCORRELATION MATRIX AND RESULTS OF MULTIPLE REGRESSION TO EXPLAIN VARIANCE IN AMOUNTS OF SCHOLARSHIPS, LOANS, AND COMBINED AMOUNTS, FOR ALL FEMALE AID RECIPIENTS

Intercorrelation Matrix

	AGE	ACT	HSR	ED	INC	SCH	LO
ACT	-.08						
HSR	-.04	.21					
ED	.07	.03	-.05				
INC	-.15	.21	.02	.09			
SCH	-.08	-.11	.02	-.07	-.19		
LO	-.16	-.32	-.36	-.19	.36	-.22	
SC-LO	-.11	-.23	-.09	-.15	.01	.78	.76

Results of Multiple Regression

Dependent Variables	Independent Variables	Beta	Partial r	R	R^2
Scholarship amts.	(None)				
Loan amts.	INC	.45	.50	.65	.42
	ACT	-.34	-.40		
	ED	-.24	-.29		
	HSR	-.30	-.36		
Combined Sc-Lo	ACT	-.23	-.23	.23	.05

TABLE 25
INTERCORRELATION MATRIX AND RESULTS OF MULTIPLE REGRESSION TO EXPLAIN VARIANCE IN AMOUNTS OF EMPLOYMENT EARNINGS, FOR MALE NON-RECIPIENTS OF FINANCIAL AID

Intercorrelation Matrix

	AGE	ACT	HSR	ED	INC
ACT	.04				
HSR	-.14	.17			
ED	-.20	.30	.00		
INC	-.09	-.01	.09	.40	
EM	.41	-.02	-.23	-.10	-.05

Results of Multiple Regression

Dependent Variables	Independent Variables	Beta	Partial r	R	R^2
Employment amts.	AGE	.41	.41	.41	.17

TABLE 26
INTERCORRELATION MATRIX AND RESULTS OF MULTIPLE REGRESSION TO EXPLAIN VARIANCE IN AMOUNTS OF EMPLOYMENT EARNINGS FOR FEMALE NON-RECIPIENTS OF FINANCIAL AID

Intercorrelation Matrix

	AGE	ACT	HSR	ED	INC
ACT	-.01				
HSR	.00	.25			
ED	.04	-.13	-.17		
INC	.00	-.23	-.10	.65	
EM	-.02	.10	.02	-.33	.13

Results of Multiple Regression

Dependent Variables	Independent Variables	Beta	Partial r	R	R^2
Employment amts.	ED	-.33	-.33	.33	.11

TABLE 27
INTERCORRELATION MATRIX AND RESULTS OF MULTIPLE REGRESSION TO EXPLAIN VARIANCE IN AMOUNTS OF EMPLOYMENT EARNINGS, FOR ALL EMPLOYED MALES

Intercorrelation Matrix

	AGE	ACT	HSR	ED	INC
ACT	-.06				
HSR	.02	.28			
ED	-.26	.22	-.13		
INC	-.12	.18	.00	.48	
EM	.14	-.05	-.08	-.01	.02

Results of Multiple Regression

Dependent Variables	Independent Variables	Beta	Partial r	R	R^2
Employment amts.	(None)				

TABLE 28
INTERCORRELATION MATRIX AND RESULTS OF MULTIPLE REGRESSION TO EXPLAIN VARIANCE IN AMOUNTS OF EMPLOYMENT EARNINGS, FOR ALL EMPLOYED FEMALES

Intercorrelation Matrix

	AGE	ACT	HSR	ED	INC
ACT	-.02				
HSR	.00	.31			
ED	.21	.00	.03		
INC	-.16	.00	.00	.25	
EM	-.05	.01	-.05	-.22	.00

Results of Multiple Regression

Dependent Variables	Independent Variables	Beta	Partial r	R	R^2
Employment amts.	ED	-.21	-.22	.22	.05

TABLE 29
MEANS, VARIANCES, AND ANALYSIS OF VARIANCE FOR TOTAL CREDIT HOURS EARNED, BY SEX AND AID RECIPIENT-EMPLOYMENT STATUS

Means and Variances

	Source	Mean	N	Variance
A	Men	49.10	29	400.02
	Women	42.94	36	467.54
B	Men	49.14	50	387.96
	Women	55.70	40	214.68
C	Men	46.79	34	440.05
	Women	49.07	28	493.99
D	Men	47.73	48	455.31
	Women	46.55	31	423.46

Homogeneity of variance:
Chi-square=7.85, p=.35

Analysis of Variance

Source	Sums of Squares	DF	Mean Squares	F	Probability
Sex	47.61	1	47.61	0.117	0.733
Aid-Employ.	1661.48	3	553.83	1.361	0.255
Interaction	1631.93	3	543.98	1.337	0.263
Error	117179.57	288	406.87		

TABLE 30
MEANS, VARIANCES, AND ANALYSIS OF VARIANCE FOR CUMULATIVE GRADE-POINT AVERAGE, BY SEX AND AID RECIPIENT-EMPLOYMENT STATUS

Means and Variances

Source		Mean	N	Variance
A	Men	2.00	29	39.30
	Women	2.02	36	81.36
B	Men	2.26	50	51.13
	Women	2.40	40	29.59
C	Men	2.06	34	41.38
	Women	2.42	28	46.23
D	Men	2.04	48	47.12
	Women	2.33	31	28.99

Homogeneity of variance:
Chi-square=13.65,p=.057

Analysis of Variance

Source	Sums of Squares	DF	Mean Squares	F	Probability
Sex	294.8	1	294.82	6.381	0.012
Aid-Employ.	385.1	3	128.38	2.779	0.041
Interaction	111.3	3	37.09	0.803	0.493
Error	13305.9	288	46.20		

TABLE 31
ANALYSIS OF COVARIANCE OF CREDIT HOURS
EARNED BY MALE STUDENTS
IN AID RECIPIENT-EMPLOYMENT GROUPS,
WITH HIGH SCHOOL RANK AND
FAMILY INCOME AS COVARIATES

Source	Sums of Squares	DF	Mean Squares	F
Aid-Employ.	916.08	3	305.36	0.766
Error	50630.82	127	398.67	
Total	51546.90	130		

$F_{.05,df=3,127}=2.68$

TABLE 32
ANALYSIS OF COVARIANCE OF CREDIT HOURS
EARNED BY FEMALE STUDENTS
IN AID RECIPIENT-EMPLOYMENT GROUPS,
WITH HIGH SCHOOL RANK AND
FAMILY INCOME AS COVARIATES

Source	Sums of Squares	DF	Mean Squares	F
Aid-Employ.	2664.67	3	888.22	2.46
Error	36518.38	101	361.57	
Total	39183.05	104		

$F_{.05,df=3,101}=2.70$

TABLE 33
ANALYSIS OF COVARIANCE OF GRADE-POINT AVERAGE EARNED BY MALE STUDENTS IN AID RECIPIENT-EMPLOYMENT GROUPS, WITH HIGH SCHOOL RANK AND FAMILY INCOME AS COVARIATES

Source	Sums of Squares	DF	Mean Squares	F
Aid-Employ.	0.99	3	0.33	0.80
Error	52.63	127	0.41	
Total	53.63	130		

$F_{.05,df=3,127}=2.68$

TABLE 34
ANALYSIS OF COVARIANCE OF GRADE-POINT AVERAGE EARNED BY FEMALE STUDENTS IN AID RECIPIENT-EMPLOYMENT GROUPS, WITH HIGH SCHOOL RANK AND FAMILY INCOME AS COVARIATES

Source	Sums of Squares	DF	Mean Squares	F
Aid-Employ.	2.86	3	0.95	2.68
Error	35.98	101	0.36	
Total	38.84	104		

$F_{.05,df=3,101}=2.70$

TABLE 35
FREQUENCY DISTRIBUTION FOR RECEIVING ASSOCIATE DEGREE OR CERTIFICATE BY AID RECIPIENT-EMPLOYMENT GROUPS

	Males				
	A	B	C	D	Total
Yes	14	20	12	16	62
No	15	30	25	38	108
Total	29	50	37	54	170

Chi-square=3.364, p=.339

	Females				
	A	B	C	D	Total
Yes	12	24	16	12	64
No	25	16	12	19	72
Total	37	40	28	31	136

Chi-square=7.876, p=.049*

*Indicates significance.

TABLE 36
FREQUENCY DISTRIBUTION FOR RECEIVING ASSOCIATE DEGREE OR CERTIFICATE, OR TRANSFERRING DIRECTLY TO A FOUR-YEAR COLLEGE BEFORE EARNING AN ASSOCIATE DEGREE, BY AID RECIPIENT-EMPLOYMENT GROUPS

Males

	A	B	C	D	Total
Yes	18	34	19	27	98
No	11	16	18	26	71
Total	29	50	37	53	169

Chi-square=4.004, p=.261

Females

	A	B	C	D	Total
Yes	18	29	18	17	82
No	19	11	10	13	53
Total	37	40	28	30	135

Chi-square=4.945, p=.176

TABLE 37
FREQUENCY DISTRIBUTION FOR CONTINUOUS ENROLLMENT BY AID RECIPIENT GROUPS

	Males				
	A	B	C	D	Total
Yes	19	33	21	28	101
No	10	17	16	26	69
Total	29	50	37	54	170

Chi-square=2.736,p=.434

	Females				
	A	B	C	D	Total
Yes	22	34	19	15	90
No	15	6	9	16	46
Total	37	40	28	31	136

Chi-square=11.496,p=.009*

*Indicates significance.

TABLE 38

SUMMARY OF FINDINGS FOR DISTRIBUTIONS OF EDUCATIONAL OUTCOMES OF AID RECIPIENT-EMPLOYMENT GROUPS, STRATIFIED BY HIGH SCHOOL RANK, INCOME LEVEL, AND SEX

Group		Total % Yes/Rank Order of Groups[1]/Probability Level[2]		
		Degree Earned	Degree or Transfer	Continuous Enrollment
HSR High	Male	55.9/C,A,B,D/.16	74.6/ - / -	67.8/ - / -
	Female	51.2/B,C,D,A/.09	62.0/ - /.77	68.8/B,C,A,D/.21
HSR Low	Male	27.5/ - /.96	48.4/B,C,A,D/.52	50.5/B,A,C,D/.39
	Female	41.0/ - / -	61.5/ - / -	61.5/ - / -
INC High	Male	33.9/ - /.84	52.3/B,C,D,A/.60	60.6/B,C,D,A/.32
	Female	50.6/B,C,D,A/.03*	63.3/B,C,D,A/.12	65.8/B,C,A,D/.16
INC Low	Male	44.0/ - / -	74.0/ - / -	60.0/ - / -
	Female	38.6/ - / -	56.8/ - / -	70.5/ - / -
Overall	Male	36.5/A,B,C,D/.34	58.0/B,A,C,D/.26	59.4/B,A,C,D/.44
	Female	47.1/B,C,D,A/.05*	60.7/B,C,D,A/.18	66.2/B,C,A,D/.01*

* Significant at the .05 level.

1 Omissions in rank order may exist where probability level of chi-square is nearly one, or where all frequencies are insufficient for results to be reliable.

2 Omissions in probability levels exist where all frequencies are insufficient for results to be reliable.

TABLE 39
MEANS, VARIANCES, AND ANALYSIS OF VARIANCE FOR
EMPLOYMENT HOURS WORKED DURING THE 1967-68 ACADEMIC YEAR
BY SEX AND AID RECIPIENT-EMPLOYMENT STATUS

Means and Variances

	Source	Mean	N	Variance
B	Men	21.71	49	108.50
	Women	13.39	38	30.84
D	Men	24.77	52	121.46
	Women	14.87	31	64.32

Homogeneity of variance:
Chi-square=19.96,p=.000*

Analysis of Variance

Source	Sums of Squares	DF	Mean Squares	F	Probability
Sex	3387.53	1	3387.53	38.857	0.000
Aid-Employ.	247.57	1	247.57	2.840	0.094
Interaction	25.52	1	25.52	0.293	0.589
Error	14471.79	166	87.18		

*Does not meet assumption of homogeneity of variance.

TABLE 40
MEANS, VARIANCES, AND ANALYSIS OF VARIANCE FOR EMPLOYMENT HOURS WORKED DURING THE 1968-69 ACADEMIC YEAR, BY SEX AND AID RECIPIENT-EMPLOYMENT STATUS

Means and Variances

Source		Mean	N	Variance
B	Men	21.41	34	74.07
	Women	13.60	30	27.97
D	Men	26.48	31	146.26
	Women	18.40	20	73.62

Homogeneity of variance:
Chi-square=18.22,p=.000*

Analysis of Variance

Source	Sums of Squares	DF	Mean Squares	F	Probability
Sex	1778.29	1	1778.29	21.830	0.000
Aid-Employ.	696.53	1	696.53	8.551	0.004
Interaction	0.50	1	0.50	0.006	0.937
Error	9041.98	111	81.46		

*Does not meet assumption of homogeneity of variance.

TABLE 41
PERCENTAGE OF AID RECIPIENTS AND NON-RECIPIENTS WHO REPORTED PART-TIME EMPLOYMENT DURING 1967-68

	Recipients		Non-Recipients	
	Men	Women	Men	Women
Number employed	49	38	52	31
Total number	79	77	91	59
Percent employed	62.0	49.4	57.1	52.6

TABLE 42
MEANS, VARIANCES, AND ANALYSIS OF VARIANCE FOR NECESSITY OF EMPLOYMENT, BY SEX AND AID RECIPIENT-EMPLOYMENT STATUS

Means and Variances

	Source	Mean	N	Variance
B	Men	1.94	47	1.41
	Women	2.00	37	1.33
D	Men	2.02	49	1.02
	Women	2.34	29	1.95

Homogeneity of variance:
Chi-square=3.84,p=.279

Analysis of Variance

Source	Sums of Squares	DF	Mean Squares	F	Probability
Sex	1.40	1	1.40	1.024	0.313
Aid-Employ.	1.47	1	1.47	1.071	0.302
Interaction	0.66	1	0.66	0.484	0.488
Error	216.34	158	1.37		

TABLE 43
FREQUENCY DISTRIBUTION FOR RESPONSES ABOUT NECESSITY OF FINANCIAL AID, BY FINANCIAL AID GROUPS

Statement

1. I could not have attended the college without the grant or loan.
2. I would have had to take a reduced academic load without the grant or loan.
3. I could have attended the college full time without the grant or loan, but only with considerable financial hardship to me or my family.
4. I could have attended the college full time without the grant or loan with little or no financial hardship to me or my family.
5. I didn't need the grant or loan.

	Men			Women		
	A	B	Total	A	B	Total
1.	12	19	31	17	20	37
2.	3	3	6	1	0	1
3.	10	22	32	15	15	30
4.	0	4	4	1	2	3
5.	0	0	0	0	0	0
Total	25	48	73	34	37	71
	Chi-sq.=3.146, p=.370			Chi-sq.-1.452, p=.693		

TABLE 44
FREQUENCY DISTRIBUTION FOR RESPONSES ABOUT ADVANTAGES OF RECEIVING FINANCIAL AID, BY FINANCIAL AID GROUPS

1. Receiving financial aid made little or no difference to my success as a student.

	Male			Female		
	A	B	Total	A	B	Total
Yes	4	12	16	5	7	12
No	25	38	63	32	33	65
Total	29	50	79	37	40	77
	Chi-sq.=1.184, p=.277			Chi-sq.=0.232 p=.630		

2. It allowed me to plan for additional years of college.

	Male			Female		
	A	B	Total	A	B	Total
Yes	16	21	37	12	21	33
No	13	29	42	25	19	44
Total	29	50	79	37	40	77
	Chi-sq.=1.279, p=.258			Chi-sq.=3.161, p=.075		

3. It allowed me to carry a full-time academic load.

	Male			Female		
	A	B	Total	A	B	Total
Yes	14	27	41	25	23	48
No	15	23	38	12	17	29
Total	29	50	79	37	40	77
	Chi-sq.=0.241, p=.624			Chi-sq.=0.830, p=.362		

TABLE 44 (CONT.)
FREQUENCY DISTRIBUTION FOR RESPONSES ABOUT ADVANTAGES OF RECEIVING FINANCIAL AID, BY FINANCIAL AID GROUPS

4. It allowed me more time to study.

	Male			Female		
	A	B	Total	A	B	Total
Yes	10	18	28	20	15	35
No	19	32	51	17	25	42
	29	50	79	37	40	77
	Chi-sq.=0.018, p=.892			Chi-sq.=2.124 p=.145		

5. It allowed me to participate more in co-curricular activities at the college.

	Male			Female		
	A	B	Total	A	B	Total
Yes	5	6	11	7	4	11
No	24	44	68	30	36	66
Total	29	50	79	37	40	77
	Chi-sq.=0.421, p=.517			Chi-sq.=1.249, p= 264		

TABLE 45
FREQUENCY DISTRIBUTION FOR RESPONSES ABOUT PERSONAL OBLIGATION FROM RECEIVING FINANCIAL AID, BY AID RECIPIENT-EMPLOYMENT GROUPS

Do you feel that acceptance of financial assistance by a student to meet educational expenses places upon him or her any special social or personal obligation?

Males

	A	B	C	D	Total
Yes	16	20	12	26	74
No	12	29	18	26	85
Total	28	49	30	52	159

Chi-square=2.676 p=.444

Females

	A	B	C	D	Total
Yes	19	19	15	9	62
No	18	19	9	18	64
Total	37	38	24	27	126

Chi-square=4.496,p=.213

TABLE 46
MEAN VALUES FOR PERSONAL, ACADEMIC, AND SOCIO-ECONOMIC CHARACTERISTICS
AND FOR AMOUNTS OF AIDS AND EMPLOYMENT EARNINGS,
BY GROUPS A, B, C, AND D

Variable*	A		B		C		D	
	Male	Female	Male	Female	Male	Female	Male	Female
Age	19.2	20.9	21.2	20.2	20.4	19.4	19.0	19.7
ACT score	18.5	17.5	19.1	18.5	17.6	18.6	19.3	18.8
High school rank	48.8	52.8	52.4	54.7	46.3	55.2	50.1	54.8
Father's educational level	11.8	11.2	10.3	11.5	12.2	12.4	12.1	12.0
Family income	5947	6150	6386	5737	10908	12009	10422	9958
Scholarship amounts	461	382	406	422	--	--	--	--
Loan amounts	794	477	506	412	--	--	--	--
Combined scholarship & loan amounts	845	482	541	449	--	--	--	--
Employment amounts	--	--	1010	503	--	--	1385	672
Combined scholarship, loan, & employment amounts	--	--	1551	955	--	--	--	--

*No average value is shown for father's occupational level.